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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/883,467 06/14/2001

Tsutomu Takayama

1232-4724

2685

27123 7590 05/05/2004

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EXAMINER

EDWARDS, PATRICK L

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 05/05/2004

8

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/883,467

Applicant(s)

TAKAYAMA ET AL.

Examiner

Patrick L Edwards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-106 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-106 is/are rejected.
- 7) ☒ Claim(s) 3,4,38,39,73 and 74 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Information Disclosure Statement*

1. The prior art system described in the background of the applicant's disclosure is considered extremely pertinent to the prosecution of the application. However, the applicant has not disclosed any documentation which teaches such a system. The examiner hereby requests that the applicant provide an information disclosure statement with documentation that teaches the system described in the background of the specification.

### *Drawings*

2. Figures 28-34 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated per the background of the invention and the description of the drawings. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Objections*

3. The follow quotation of 37 CFR § 1.75(d)(1) provides the basis of objection:

(d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. (See § 1.58(a)).

4. Claims 3, 4, 38, 39, 73 and 74 are objected to under 37 CFR § 1.75(d)(1) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery, and failing to conform to the invention as set forth in the remainder of the specification.

With regard to these claims, no mention has been made in the specification of interpolating an image region which has been enlarged. Additionally, no mention is made in the specification of interpolating an image region which has been reduced in size.

### *Claim Rejections - 35 USC § 103*

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 7, 36-38, 42, 71-73, 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edgar (USPN 5,266,805) in view of Florent (USPN 5,832,111)

With regard to claim 71, which is representative of claims 1 and 36, Edgar discloses a visible light source for mainly emitting visible light, an infrared light source for mainly emitting infrared light and a photoelectric converter for converting an optical image into an electrical signal (Edgar col. 7 lines 10-28). The color camera disclosed in Edgar is a photoelectric converter which converts an optical image into an electrical signal as recited in the claim.

Edgar further discloses a means for comparing a threshold value with infrared image signal components and extracting infrared image signal components not more than the threshold value (Edgar col. 12 lines 26-30).

Edgar further discloses a means for executing an interpolation process of a visible light image signal on the basis of the infrared image signal components not more than the threshold value (Edgar col. 12 lines 30-35). Although the Edgar reference discloses comparing infrared image signal components to a threshold value in order to determine the existence of a defect, it fails to expressly detail a means for determining the threshold value. Florent, however, discloses a means for generating a histogram on the basis of an infrared image signal and calculating a threshold value on the basis of that histogram (Florent col. 11 lines 14-19).

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Edgar's image reading apparatus by calculating a threshold value on the basis of a generated histogram as taught by Florent. Such a modification would have allowed for a system in which the threshold value was determined from the grey levels of the image (Florent col. 3 lines 40-43). This would have decreased uncertainty about the choice of a threshold value and consequently allowed for more accurate defect detection (Florent col. 3 lines 40-43).

With regard to claim 106, Edgar further discloses a computer program product comprising a computer usable medium having computer readable program code (Edgar col. 8 lines 5-9).

With regard to claim 72, which is representative of claims 2 and 37, Edgar discloses that the interpolation means uses surrounding visible light image signal components (Edgar col. 13 lines 48-52). The adjacent image information disclosed in Edgar is analogous to surrounding visible light image signal components as recited in the claim.

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With regard to claim 73, which is representative of claims 3 and 38, Edgar further discloses interpolating the visible image signals which correspond to an image region corresponding to the extracted infrared image signal components, and a region obtained by enlarging the image region by a predetermined size, using surrounding visible image signals (Edgar col. 13 lines 64-68).

With regard to claim 77, which is representative of claims 7 and 42, Florent discloses generating a histogram of frequencies of occurrence of respective gray levels of the infrared image signal (Florent col. 1 lines 34-40).

7. Claims 4, 39 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Edgar and Florent as applied to claims 1, 36 and 71 above, and further in view of Hirota et al. (USPN 6,064,494). The arguments as to the relevance of Edgar and Florent as applied above are incorporated herein.

With regard to claim 74, which is representative of claims 4 and 39, Hirota discloses interpolating a reduced image region (Hirota col. 19 lines 7-37). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Edgar and Florent's image reading apparatus by performing the interpolation step on a reduced image region as taught by Hirota. Such a modification would have allowed for a system that could have corrected defects in a reduced image (Hirota col. 19 lines 10-11).

8. Claims 5, 40 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Edgar and Florent as applied to claims 1, 36 and 71 above, and further in view of Beatty et al. (USPN 5,325,443). The arguments as to the relevance of Edgar and Florent as applied above are incorporated herein.

With regard to claim 75, which is representative of claims 5 and 40, the aforesaid combination discloses generating an infrared image signal histogram, calculating a threshold value based on the histogram, and interpolating the visible image signals based on the infrared image signals that fall below the calculated threshold. The combination fails to expressly disclose performing edge correction on the image signal before the defects in the image are identified. Beatty, however, discloses performing edge correction on an image signal before the defects of the image are detected (Beatty col. 5 lines 4-15).

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Edgar and Florent's image reading apparatus by performing edge correction on an image before the defects in the image are identified. Such a modification would have allowed for accurate representation of the size of the image defects and the subsequent accurate detection of the edges of an image. This would have reduced the amount of defect data to be corrected (Beatty col. 5 lines 4-15).

9. Claims 6, 41 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Edgar, Florent and Beatty as applied to claims 5, 40 and 75 above, and further in view of Hirota (USPN 5,357,353). The arguments as to the relevance of the aforesaid combination as applied above are incorporated herein.

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With regard to claim 76, which is representative of claims 6 and 41, the aforesaid combination discloses an edge correction means, but fails to expressly disclose that the amount of edge correction is set in association with MTF deterioration due to chromatic aberration. Hirota, however, discloses edge emphasis which is set in association with MTF deterioration due to chromatic aberration (Hirota col. 15 line 62 – col. 16 line 14). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Edgar, Florent's and Beatty's image reading apparatus in order to have an edge correction means which is set in association with MTF deterioration due to chromatic aberration as taught by Hirota. Such a modification would have allowed for a system of edge correction which could adjust to the color features of an image.

10. Claims 8-13, 22-25, 43-48, 57-60, 78-83 and 92-95 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Edgar and Florent as applied to claims 7, 42 and 77 above, and further in view of Nichani et al (USPN 5,949,905). The arguments as to the relevance of the aforesaid combination as applied above are incorporated herein.

With regard to claims 78 and 79, which are representative of claims 8, 9, 43 and 44, Nichani discloses calculating a threshold value by subtracting a value given by a predetermined relation from a gray leveling representing an image (Nichani col. 3 lines 20-27). Nichani further discloses calculating a standard deviation and determining the value to be subtracted on the basis of the standard deviation (Nichani col. 3 lines 20-27). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Edgar and Florent's image reading apparatus by specifying that a threshold value is determined on the basis of a calculated standard deviation as taught by Nichani. Such a modification would have allowed for a system that could detect defect signals based on their deviation from a given set value.

With regard to claim 92, which is representative of claims 22 and 57, Nichani discloses calculating an average gray level of the histogram and calculating the threshold value by subtracting a predetermined value from the average gray level (Nichani col. 3 lines 20-27).

With regard to claim 93, which is representative of claims 23 and 58, Nichani discloses that the predetermined value is pre-stored (Nichani col. 2 lines 61-67). The standard deviation values disclosed in Nichani are pre-stored.

With regard to claim 94, which is representative of claims 24 and 59, Nichani discloses that the predetermined values are externally input (Nichani col. 3 lines 48-52).

With regard to claim 95, which is representative of claims 25 and 60, Nichani discloses calculating a standard deviation and determining the predetermined value on the basis of the standard deviation (Nichani col. 3 lines 20-27).

With regard to claim 80, which is representative of claims 10 and 45, Nichani discloses calculating an intermediate value of the frequencies of occurrence of the histogram and calculating the threshold value by subtracting a predetermined value from a gray level corresponding to the intermediate value (Nichani col. 7 lines 20-54).

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With regard to claim 81, which is representative of claims 11 and 46, Nichani discloses that the predetermined value is pre-stored (Nichani col. 7 lines 51-54).

With regard to claim 82, which is representative of claims 12 and 47, Nichani discloses that the predetermined value is externally input (Nichani col. 3 lines 48-52).

With regard to claim 83, which is representative of claims 13 and 48, Nichani discloses calculating a standard deviation determining the predetermined value on the basis of the standard deviation (Nichani col. 7 lines 51-54).

11. Claims 14-17, 49-52 and 84-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edgar and Florent as applied to claims 7, 42 and 77 above, and further in view of Farrell et al. (USPN 6,222,642). The arguments as to the relevance of Edgar and Florent as applied above are incorporated herein.

With regard to claim 84, which is representative of claims 14 and 49, Farrell discloses calculating a maximum frequency of occurrence of the histogram and calculating the threshold value by subtracting a predetermined value from a gray level corresponding to the maximum frequency of occurrence of the histogram (Farrell col. 5 lines 22-30). The white peak value disclosed in Farrell is analogous to a gray level corresponding to the maximum frequency of occurrence as recited in the claim.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Edgar and Florent's image reading apparatus by specifying that a threshold value is determined on the basis of a calculated standard deviation as taught by Farrell. Such a modification would have allowed for a system that could detect defect signals based on their deviation from a given set value.

With regard to claim 85 and 86, which are representative of claims 15, 16 and 50, 51 Farrell discloses where the value can be pre-stored or externally input (Farrell col. 5 lines 19-32)

With regard to claim 87, which is representative of claims 17 and 52, Farrell discloses that the predetermined value is determined on the basis of a calculated standard deviation (Farrell col. 4 lines 30-40).

12. Claims 18-21, 53-56 and 88-91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edgar and Florent as applied to claims 7, 42 and 77 above, and further in view of Xu et al. (USPN 6,341,172). The arguments as to the relevance of Edgar and Florent as applied above are incorporated herein.

With regard to claim 88, which is representative of claims 18, 26 and 53, 61, 88 and 96, Xu discloses calculating a maximum gray level of the histogram and calculating the threshold value by subtracting a predetermined value from the maximum gray level (Xu col. 9 lines 17-27).

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Edgar and Florent's image reading apparatus by specifying that a threshold value is determined on the basis of a calculated standard deviation as taught by Xu. Such a modification would have allowed for a system that could detect defect signals based on their deviation from a given set value.

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With regard to claims 89 and 90, which is representative of claims 19, 20, 27, 28, 54, 55, 62, 63, 89, 90, 97 and 98 Xu discloses where that the value can either be pre-stored or externally input (Xu col. 3 lines 7-55).

With regard to claims 91, which is representative of claims 21 and 56, Xu discloses that the predetermined value is determined on the basis of a calculated standard deviation (Xu col. 9 lines 17-27).

13. Claims 29-31, 64-66 and 99-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edgar and Florent as applied to claims 7, 42 and 77 above, and further in view of Ito et al. (USPN 5,555,318). The arguments as to the relevance of Edgar and Florent as applied above are incorporated herein.

With regard to claim 99, which is representative of claims 29 and 64, Ito discloses Calculating a maximum gray level of the histogram and calculating an average gray level of the histogram and calculating the threshold value by subtracting a product, which is obtained by multiplying a difference between the maximum gray level and the average gray level by a predetermined value, from the average gray level (Ito col. 8 lines 39-48).

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Edgar and Florent's image reading apparatus by specifying that a threshold value is determined on the basis of a calculated difference between an average value and a maximum value as taught by Ito. Such a modification would have allowed for an additional method of setting a defect threshold.

With regard to claims 100 and 101, which are representative of claims 65-66 and 30-31, Ito discloses that the value can either be pre-stored or externally input (Ito col 3 line 20 – col. 5 line 30).

14. Claims 32, 67 and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Edgar and Florent as applied to claims 1, 36 and 71 above, and further in view of Maeda et al. (US Pub. No. 2003/0128889). The arguments as to the relevance of Edgar and Florent as applied above are incorporated herein.

With regard to claim 102, which is representative of claims 32 and 67, the aforesaid combination discloses processing visible image signals and infrared image signals for an entire image, but fails to expressly disclose performing this process on an image which has been segmented into a plurality of blocks. Maeda, however, discloses segmenting an infrared image signal in a plurality of blocks and performing visible and image signal processing on the respective blocks (Maeda paragraph [0121]).

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Edgar and Florent's image reading apparatus by segmenting the infrared image into a plurality of blocks as taught by Maeda. Such a modification would have allowed for the accurate detection of image defects (Maeda paragraph [0119]).

15. Claims 33, 34, 68, 69, 103 and 104 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Edgar and Florent as applied to claim 1, 36 and 71 above, and further in view of Young Jr. et al. (USPN 6,707,557), which will be referred to herein as 'Young' or 'the Young reference'. The arguments as to the relevance of Edgar and Florent as applied above are incorporated herein.



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With regard to claim 103, which is representative of claims 33 and 68, Young discloses detecting signal components corresponding to a holder for holding the transparent document, and replacing the detected signal components by a predetermined signal value (Young col. 18 lines 57-67). The unexposed regions as disclosed in Young are analogous to the signal components corresponding to a holder for holding the transparent document as recited in the claim. This can be seen from Figure 2 of the Young reference which shows the unexposed regions as holders which hold the transparent document.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Edgar and Florent's image reading apparatus by detecting signal components which correspond to an image holder which holds the transparent document, and replacing those signal components by a predetermined value as taught by Young. Such a modification would have allowed for the reduction of high frequency defects (Young col. 18 lines 65-67).

With regard to claim 104, which is representative of claims 34 and 69, Young further discloses that the predetermined value which replaces the holder (or unexposed region) signal components is the average signal value (Young col. 18 lines 57-67).

16. Claims 35, 70 and 105 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Edgar and Florent as applied to claims 1, 36 and 71 above, and further in view of Banton et al. (USPN 6,078,051). The arguments as to the relevance of Edgar and Florent as applied above are incorporated herein.

With regard to claim 105, which is representative of claims 35 and 70, Banton discloses detecting signal components corresponding to a holder for holding the transparent document, and then removing the detected signal components (Banton col. 1 lines 18-31). The background image data which falls outside the detected exterior edges of the document as disclosed in Banton is analogous to the image holder as recited in the claim.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Edgar and Florent's image reading apparatus by removing signal components which correspond to an image holder which holds the transparent document as taught by Banton. Such a modification would have saved storage space (Banton col. 1 lines 26-27).

### *Conclusion*

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Lynn Edwards

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**BRIAN WERNER**  
**PRIMARY EXAMINER**